

REMARKS

This responds to the Office Action mailed on March 21, 2006.

Claims 1, 7 and 20 are amended, claims 6, 8-19, and 41-49 are canceled, and no claims are added; as a result, claims 1-5, 7 and 20-40 are now pending in this application.

§103 Rejection of the Claims

Claims 1-3 and 5-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of Mukojima (U.S. 6,418,226 B2).

Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of Mukojima (U.S. 6,418,226 B2) and in further view of McGrath et al. (U.S. 6,628,787 B1).

Claims 20-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of Gerzon (U.S. 4,086,433).

Claims 33 and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of Gerzon (U.S. 4,086,433).as applied to claim 32 above, and further in view of Clemow (U.S. 6,577,736 B1).

Claims 34-36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of Gerzon (U.S. 4,086,433).as applied to claim 32 above, and further in view of McGrath-A and McGrath et al. (U.S. 6,628,787 B1) as McGrath-B.

Claims 38, 39 and 40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGrath (U.S. 6,259,795 B1) in view of McGrath et al. (U.S. 6,628,787 B1) and Gerzon (U.S. 4,086,433).as applied to claim 34 above, and further in view of Clemow.

Applicants respectfully traverse this rejection for the reasons set out below, and ask the Examiner for reconsideration.

Claim 1 has been amended to include the limitations of claims 6 and 8. It should be noted that Applicants have not amended the claims to overcome any prior art that they are aware of but merely to expedite allowance of this application. As basis for these amendments is

clearly provided in claims 6 and 8, no new search is required. Applicants reserve the right to pursue patent protection for the subject matter as claimed in claim 1 prior to amendment in one or more continuation applications.

To establish a **prima facie** case of **obviousness**, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As conceded in the Office Action, McGrath does not describe the limitation “wherein the left-channel audio output excludes the second encoded signals and the right-channel audio output excluded the first encoded signals.” In McGrath, an encoder (B-Format determination – see Figure 2) provides B-channel information (**not** left and right channel information) to a decoder (see Figure 4).

It should also be noted that, in McGrath, the combination of the components (X, Z, W and “Y” – see Figure 4) are only summed (see blocks 73 and 74) just prior to D/A conversion and *after decoding*. The first notion of left and right channel outputs is provided by the analogue outputs 82, 83 (see column 7, lines 26-27). In fact, McGrath teaches away from providing separate left and right channels during the encoding stage. As can be clearly seen from the figures in McGrath, X, Y, Z and W components are output from the encoder stage (see for example Figure 3) and these multiple components are then decoded where after they are summed to provide left and right output signals (see Figure 4).

In stark contrast to McGrath, Mukojima describes an **encoder** which has left and right audio output signals. Mukojima does not describe any decoding of previously encoded signals. In fact the word “decoder” is not even mentioned in Mukojima. Further, it is important to note that Mukojima does not suggest or describe a solution which involves multiple sound sources and, if extended to multiple sound sources, Mukojima would require individual HRTF filters for each sound source which is clearly computationally expensive.

In contrast to the disclosures in McGrath and Mukojima, claim 1 of the present application relates to:

A method for positioning of a plurality of audio signals, the method including:

- selecting a set of spatial functions, each having an associated scaling factor;
- providing a first set of amplifiers and a second set of amplifiers, the gains of the amplifiers being functions of the scaling factors;
- receiving a first audio signal of the plurality of audio signals;
- providing a first direction representing the direction of the source of the first audio signal;
- adjusting the gains of the first and the second set of amplifiers depending on the first direction;
- applying the first set of amplifiers to the first audio signal to produce first encoded signals;
- delaying the first audio signal to produce a first delayed audio signal; and
- applying the second set of amplifiers to the first delayed audio signal to produce second encoded signals;
- providing a third set of amplifiers and a fourth set of amplifiers, the gains of the amplifiers being functions of the scaling factors;
- receiving a second audio signal of the plurality of audio signals;
- providing a second direction representing the direction of the source of the second audio signal;
- adjusting the gains of the third and the fourth set of amplifiers depending on the second direction;

applying the third set of amplifiers to the second audio signal to produce third encoded signals;

delaying the second audio signal to produce a second delayed audio signal;

applying the fourth set of amplifiers to the second delayed audio signal to produce fourth encoded signals;

mixing the first and the third encoded signals or the first and the fourth encoded signals to provide a left-channel audio output;

mixing the second and the fourth encoded signals or the second and the third encoded signals to provide a right-channel audio output, the left-channel audio output excluding the second encoded signal and the right-channel audio output excluding the first encoded signal; and

decoding the encoded signals using filters that are defined based on the spatial functions.

It should be noted that the functionality in claim 1 relates to **encoding** a multi-source input signal to provide left-channel and right-channel signals, mixing encoded signals, and then **decoding** the mixed encoded signals. Thus, a *decoder receives encoded left-channel and right channel signals* and only a single set of HRTF filters is required at the decoder for multiple input/source signals. This is in stark contrast to McGrath where the decoder does not receive encoded left-channel and right-channel signals and Mukojima which does not describe any decoding and requires multiple sets of HRTF filters (i.e., a set of HRTF filters for each input/source signal).

THE PRIOR ART REFERENCES DO NOT TEACH OR SUGGEST ALL CLAIM LIMITATIONS, WHEN CONSIDERED SINGULARLY OR IN COMBINATION.

Claim 1 includes the following limitation:

mixing the first and the third encoded signals or the first and the fourth encoded signals to provide a left-channel audio output;

mixing the second and the fourth encoded signals or the second and the third encoded signals to provide a right-channel audio output, the left-channel audio output excluding the second encoded signal and the right-channel audio output excluding the first encoded signal...

The Office action concedes that McGrath does not describe that the left-channel audio output excludes the second encoded signals and the right-channel output excludes the first decoded signals. Clearly Mukojima only describes encoding and is totally silent on any decoding, and the decoder in McGrath would be non-functional in combination with the encoder of Mukojima. Therefore, Mukojima cannot cure the above defect in McGrath. Thus, for this reason alone the combination of McGrath and Mukojima does not disclose all the limitations of claim 1.

THERE IS NO SUGGESTION OR MOTIVATION TO COMBINE THE REFERENCES.

As mentioned above Mukojima only describes an encoder. However the Office Action submits that “it would be obvious to a person of ordinary skill in the art to use the directional encoding methods of Mukojima in the invention of McGrath. The outputs (McGrath: fig.3 #60-63) of the gain functions (McGrath: fig3 #40-41) would have been directionally encoded according to a right or left-channel, as does Mukojima in figure 4.” Applicants strongly disagree with this submission.

First, merely inserting the encoder of Figure 4 of Mukojima into the encoder of McGrath (Figure 3) would not make any engineering sense at all and merely result in a duplication of filter components and gain components. Clearly, there can be no motivation to combine McGrath and Mukojima in this manner. Secondly, replacing the encoder in Figure 3 of McGrath with the encoder in Figure 4 of Mukojima would also make no sense and render McGrath inoperative. Such a replacement would render the decoder in Figure 4 of McGrath redundant as the *HRTF functionality is already incorporated in the circuitry of Figure 4 of Mukojima*. Further, if McGrath was modified as suggested, feeding the left-channel and right-channel

outputs into the decoder (filtering elements 70) configured to receive X, Z, W, and Y components would clearly not work.

In view of the above it is submitted that combining McGrath with Mukojima by altering McGrath to include the encoder of Mukojima would destroy the stated object of McGrath “provide for an *efficient* and effective method of transmission of soundfield signals to multiple users.” If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP § 2143.01.

Further, the Office Action incorrectly submits that the “motivation for using the method of Mukojima in the invention of McGrath would have been to give the system a way to individually adjust the spatial characteristics of a channel without affecting the characteristics of the other channel.” Clearly this objective cannot be accomplished by combining or replacing the encoder of Mukojima (Figure 4) with the encoder of McGrath (Figure3). A reason for this is that Figure 4 of McGrath shows a **decoder which clearly shows that it combines the inputs it receives**. Thus, combining McGrath and Mukojima would not achieve the purpose articulated by the Office Action.

The Court of Appeals for the Federal Circuit recently addressed the evidentiary standard required to uphold an obviousness rejection. *In re Lee*, 61 USPQ2d 1430, (CAFC 2002). Specifically, the Federal Circuit stated: “[the] factual question of motivation is material to patentability, and (can) not be resolved on subjective belief and unknown authority. *Id.* at 1434. This finding must be based upon **substantial evidence**, and not subjective musings or conjecture by the Examiner. *Id.* Deficiencies in the evidentiary record cannot be cured by general conclusions such as “general knowledge” or “common sense.” *Id.* Accordingly,

unsupported, conclusory statements cannot be relied upon to close holes in the evidentiary record. *Id.* Motivation must be supported by substantial evidence of record. *Id.* Unless the Action can demonstrate an evidentiary record based on concrete prior art references that establish that it would have been obvious to a person with ordinary skill in the art to incorporate the features of Applicants' dependent claims, the claims should be in condition for allowance.

It is also important to note that nothing in references themselves suggests that they are combinable.

In view of the above, it is submitted that McGrath in combination with Mukojima does not disclose all the limitations of claim 1 and, accordingly, claim 1 is allowable. As claims 2-5 and 7 depend upon claim 1, they are also allowable.

In light of the above, Applicants respectfully submit that the rejection under 35 U.S.C. § 103 has been overcome, and withdrawal of this rejection is therefore respectfully requested.

Claim 20 has been amended to clarify that the encoded signals are left-channel signals and right-channel signals. The Office Action concedes that "McGrath does not disclose expressly wherein the left-channel audio signal excludes the second set of filtered signals and the right-channel audio signal excludes the first set of filtered signals." However, the office action submits that the Gerzon cures this defect.

Applicants strongly disagree with this submission as neither McGraw nor Gerzon show independent processing of the left-channel and right-channel encoded signals. Both Gerzon and McGrath describe prior ambisonic decoders where the encoded signals (W, X, Y, and Z) that are received by the decoder are **not** separated into left-channel or right-channel signals. In Gerzon, the computation of the loudspeaker signals (LBU...RBD) in Figure 8 are **output** audio signals that are output from a matrix (26) described in more detail in column 5, lines 47-62. It is

clearly evident from Figure 8 and the referenced text that the **decoder receives encoded signals (W, X, Y, and Z)** which cannot read on to the limitation of claim 20 of “the left-channel channel encoded input excluding the second encoded signals and the right-channel encoded input excluding the first encoded signals.”

In view of the above, it is submitted that McGrath in combination with Gerzon does not disclose all the limitations of claim 20 and, accordingly, claim 20 is allowable. As claims 21-40 depend upon claim 20, they are also allowable.

CONCLUSION

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney 408-278-4041 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

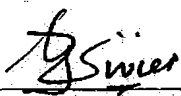
Respectfully submitted,

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